Dressing Poultry — Live Bird to Freezer

by

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and
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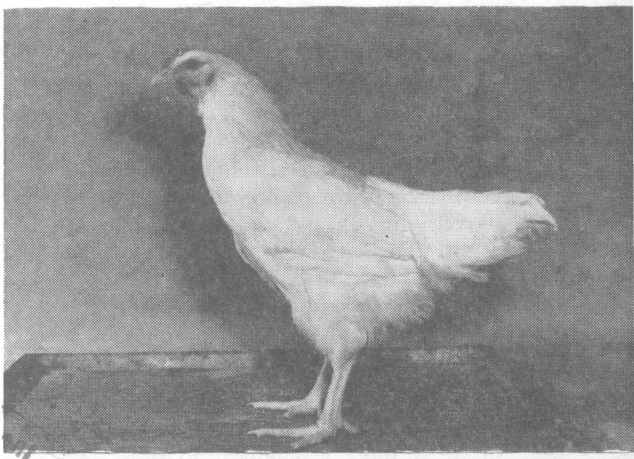

Fig. 1a—A healthy, well-fleshed market bird.

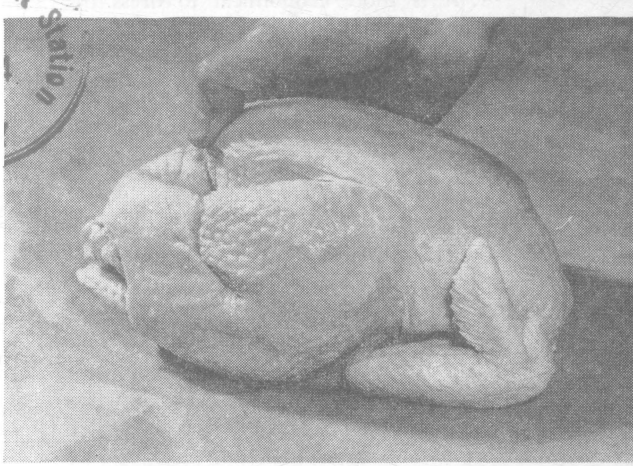

Fig. 2a—Testing a bird for age. Broilers have flexible breastbone. Fowls have hardened breastbone.

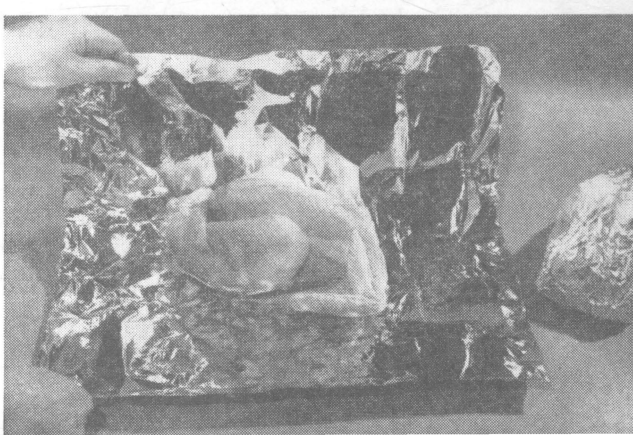

Fig. 2b—Foil wrapping protects the bird in the freezer.

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Ohio Consumes 25 Percent More Poultry Than The State Produces

MORE than 30,000,000 chickens, turkeys, ducks and geese are raised annually on the more than 300,000 farms, battery plants and back yards in Ohio. These birds supply only about 75 percent of the poultry meat required to meet the needs of the 8,000,000 people in the state.

The large number of cities, towns, and villages in the state provide good markets for Ohio poultry. Producers of poultry may find it to their advantage to process and market their poultry meat direct to the consumer, if laws and city regulations permit. This marketing may be done at the farm in roadside stands, by door to door sales, to restaurants and hotels. Other producers may prefer to sell their birds to live poultry buyers.

Why Dress Poultry on the Farm?

1. It is more economical to dress the live birds for home use than to sell them alive and buy ready-to-cook poultry. This is particularly true where only enough birds are raised to meet the family needs.

2. There is a better market for ready-to-cook than live poultry. Most consumers are not equipped and do not like to dress poultry.

3. The labor cost is low because the dressing may be done by the family during spare time.

4. The necessary equipment is simple and inexpensive.

5. The birds may be dressed when ready, a few at a time, with a saving in labor and feed costs.

6. The birds may be frozen and held in the home freezer when market prices are low.

7. The dressing and evisceration waste products are easily disposed of on the farm as animal feed or fertilizer.

8. Some poultry may be dressed for various exhibits and contests such as 4-H and FFA contests, fairs, and other exhibits.

Processing Losses and Costs

One should receive enough more per pound for ready-to-cook over live poultry to cover: (1) loss in weight due to processing, and (2) processing and packaging costs

The loss in weight for the principal kinds and classes of poultry are about as follows:

Kind of poultry	Live weight	Approx. Shrinkage from Live to dressed weight	Approx. Shrinkage from Live to ready-to-cook weight
	Pounds	*Percent*	*Percent*
Chickens			
Broilers, fryers	under 4	11 -12	34-38
Roasters	4 and over	9½-11	30-35
Hens (stewing chickens; fowl)	all weights	10 -11	31-36
Turkeys	under 13	10½-11	24-28
	13-25	9 -10	22-28
	25 and over	9 - 9½	20-23

To determine the ready-to-cook price necessary, exclusive of processing and packaging costs, when the live broiler price is known, subtract the percent shrinkage from 100 and divide the live market price by this amount. For example, if the live broiler price is 24 cents per pound and live to ready-to-cook shrinkage is 38 percent, 100 — 38 equals 62. Twenty-four cents divided by 62 equals 38.7 cents per pound for ready-to-cook broilers.

The processing and packaging cost from live to ready-to-cook poultry in commercial plants is generally estimated at 7.5 cents per pound. It includes labor, buildings and equipment, trucking, fuel and electricity, and packaging materials. Therefore, unless the processing and packaging costs can be kept under 7.5 cents per pound, the poultrymen would have to receive 38.7 cents plus 7.5 cents or 46.2 cents or more per pound for ready-to-cook broilers to justify processing them, when

the live broiler price is 24 cents per pound. It is believed that the processing and packaging costs can be kept considerably under the above figure on many farms by good processing methods.

Live Poultry Grades

There are three grades of live market poultry. They are used in grading different classes of poultry. The principal characteristics taken into consideration and the grade requirements are:

Characteristics	GRADES A	B	C
Health and vigor	good (Fig. 1)	good	poor
Feathering			
covering	complete	fairly complete	lacking
pin feathers	few scattered	moderate	large number
Conformation			
breast	long broad, well fleshed	fairly well fleshed	narrow, thin covering
breast bone	slight curve, ⅛" dent	slightly crooked	crooked
back	normal	moderately crooked	crooked
legs and wings	normal	slightly misshapen	misshapen
Fat covering	well covered under skin, no excess abdominal fat	fairly well covered, may have excess of abdominal fat	lack of fat on back and thighs
Defects	slight	moderate	serious
Tears and broken bones	free	free	free
Bruises, scratches and callouses	slight	moderate	unlimited to extent, no part unfit for food

Sick poultry should be rejected for human consumption. Birds showing a fever, infectious bronchitis, complete paralysis, anemia, emaciation, and body discoloration should be rejected.

Some Common Market Terms

The sellers and buyers of poultry need to know the common terms used in the industry. Some of them are:

Kind of poultry: Refers to species such as chickens, turkeys, ducks, geese, guineas, and pigeons.

Class: Refers to different ages and sexes of the different kinds of poultry.

Dressed: Refers to market poultry which has been slaughtered, bled, and the feathers removed. Dressed poultry is sometimes referred to as "packer dressed" or "New York dressed."

Ready-to-Cook: Refers to dressed poultry which has had the head, feet, oil gland, intestinal tract, lungs, trachea, and reproductive organs removed. Ready-to-cook poultry is sometimes referred to as "eviscerated" or "oven ready poultry."

Broiler or Fryer Chicken: Under 16 weeks of age, tender meated; soft, pliable, smooth textured skin; and flexible breastbone cartilage. (Fig. 2a)

Roaster: Under 8 months of age with characteristics of broiler but slightly less flexibility of breastbone cartilage.

Stag: A male chicken 6 to 10 months old with coarse skin and toughened and darkened flesh.

Fowl: A female chicken more than 10 months old with meat less tender than that of a roaster and non-flexible breastbone.

Cock or Rooster: A male chicken more than 10 months old with coarse skin,

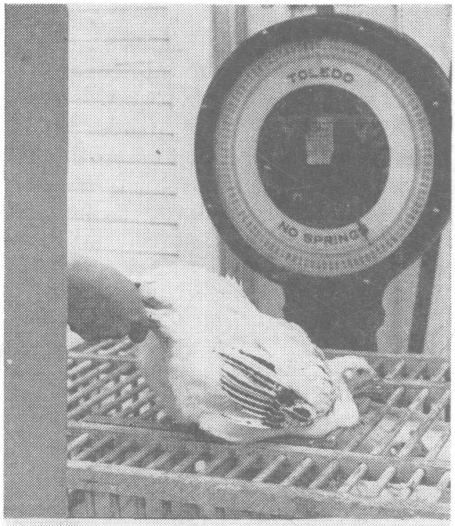


Fig. 3—Handling to avoid bruising.
Fig. 4a and 4b—Rope and block for holding while sticking.

toughened and darkened meat, and hard breastbone.

Fryer Turkey: Under 16 weeks of age, tender meated; soft, pliable, smooth-textured skin; and flexible breastbone cartilage.

Young Turkey: Under 8 months of age with characteristics of the fryer but with breastbone cartilage somewhat less flexible.

Grading: The classification of poultry by class, weight, and quality. It may refer to live, dressed, or ready-to-cook poultry.

Poultry Inspection: Examination of birds for indications of disease or other conditions which may make the birds unfit for human consumption.

Handling Live Poultry for Slaughter

Birds should be caught and held by the shanks to avoid bruising of wings, breast or fleshy parts of legs. (Fig. 3)

Feed, but not water, should be taken away from the birds about 8 hours before slaughter.

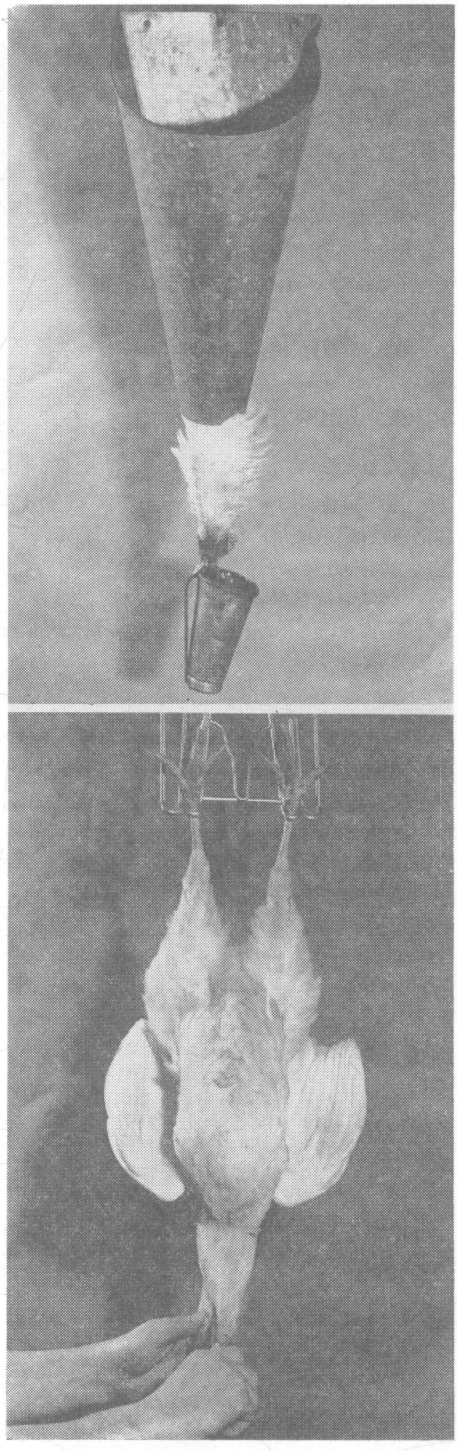
The birds should be held in a cool, well-ventilated place. Avoid overcrowding and holding birds in coops (Fig. 3) longer than absolutely necessary. The standard-size coop (3 x 2 x 1 ft.) will hold 14 to 20 broilers or fryers, 12 average size fowl or 8 to 10 ducks. A taller coop (3 x 2 x 1⅓ ft.) will accommodate 10 to 12 roosters or large hens, 6 to 8 geese, or 5 to 6 turkeys.

Holding Birds for Slaughter

Birds should be held for slaughter in a manner to reduce struggling. Flapping of wings or jumping around stirs up dust and may result in bruises and broken bones.

Clothesline cord and block probably make the simplest and cheapest method of holding a bird. The small (2″ x 2″) block on the end of the cord should be on a level with the person's eyes before the bird is hung up. To hang the fowl, wind the cord around its legs and back of the

Fig. 5—Holding in killing cone.
Fig. 6—Holding in shackle in position for bleeding.



block. This will hold without tying a knot. (Fig. 4)

Killing cones are satisfactory for holding birds for bleeding. Struggling may be held to a minimum without flapping or injury to the wings. Attaching a weight into the cleft in the roof of the mouth will prevent the bird from working its way up and out of the cone. (Fig. 5)

Shackles may be used for holding birds for bleeding, scalding, and picking (Fig. 6) The birds are conveyed on shackles in line-operated poultry dressing plants.

Bleeding

Poultry is usually slaughtered by cutting the jugular vein (Fig. 7) and allowing the bird to bleed to death. The time required varies from less than a minute for small broilers to more than two minutes for large turkeys. The heart contin-

Fig. 7—Location of jugular vein and place to cut in bleeding.

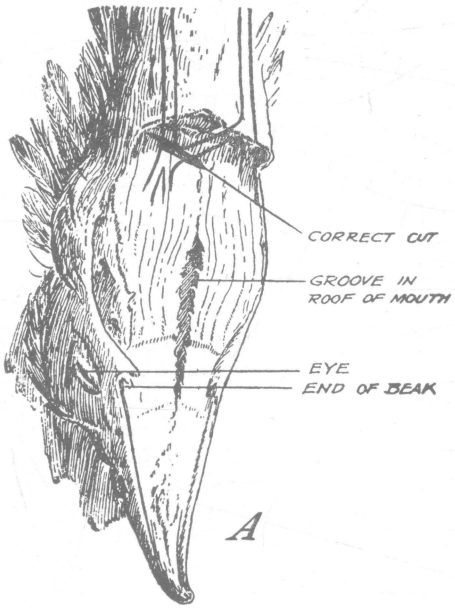
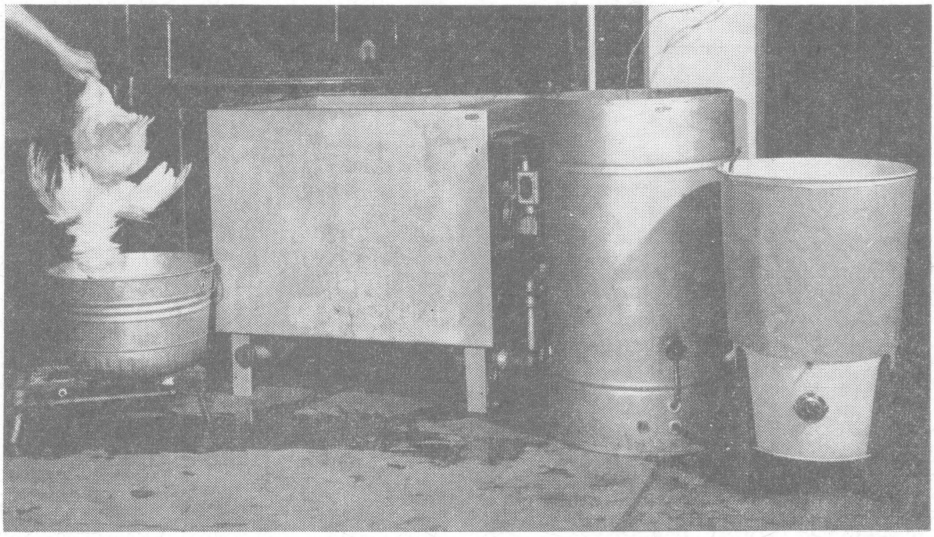


Fig. 8—Some types of poultry scalding equipment.



ues to beat for several seconds and pumps blood from the body.

An inside cut is usually made when birds are to be marketed before evisceration. It leaves no external evidence of the throat having been cut.

An outside cut (Fig. 6) is usually made with poultry to be processed ready-to-cook. It is easier to make; requires less time; and fewer cases of poor bleeding result. Poor bleeding is indicated by a pink appearance of the carcass or the presence of blood in the veins around the joints, in the wings, or around the feather follicles.

Scalding

Submerging and agitating birds, as soon as dead, in hot (128°-140°F) water for a short period (30-60 seconds) greatly facilitates the removal of feathers. A large pail, a tub or a thermostatically controlled scalding tank (Fig. 8) may be used.

Younger birds should be immersed for a shorter time and at a lower temperature than older ones.

Broilers and fryers should be dipped into water at 126°-128°F for 15 to 30 seconds for best appearance of the dressed carcass. Higher temperatures and longer periods of time destroy the bloom or yellow layer of the skin, leaving a "barked" appearance, and the surface becomes darker in color. Feather removal is easier if the scalding temperature is 138°-140°F, but the appearance of the bird is not as good. However, the keeping quality and food values are just as good. Appearance is not so important if the bird is to be cut-up, packaged, or frozen.

Fowls are usually scalded at a slightly higher temperature and for longer periods than young chickens because the skin is tougher and the feathers are harder to remove.

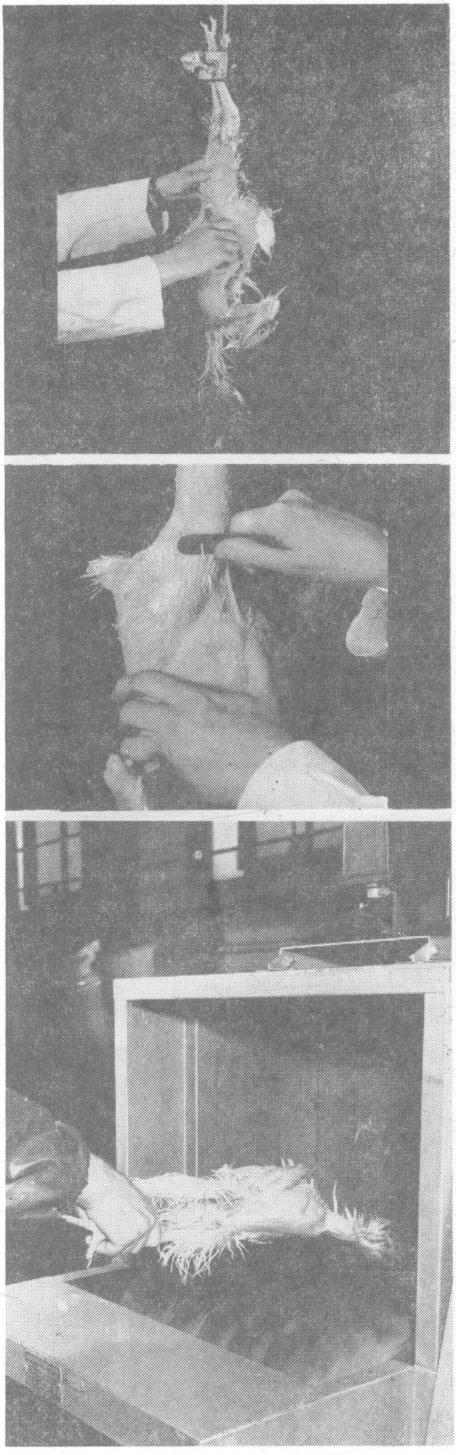
Turkeys require about the same scalding conditions as chickens.

Ducks and geese may be scalded at 150 to 160°F for 1½ to 2½ minutes.

Overscalding is indicated by a shiny appearance and sticky condition of the skin while picking.

Scalding time and temperature may be reduced slightly by adding a water softener to the water. The softener reduces surface tension and permits the water to penetrate to the base of the feathers more quickly. Suitable products are sold for

Fig. 9a—Hand picking.
Fig. 9b—Removing pin feathers.
Fig. 10—Mechanical picking.



dish washing, and by some processing equipment manufacturers.

Each poultryman will have to experiment to determine the scalding time and temperature to use with his facilities, in order to satisfy his customers and keep picking costs as low as possible.

Picking

The bird should be picked before it cools and before the feathers "set."

Hand picking is generally used where only a few birds are to be picked at a time. The bird is hung with a cord and block (Figs. 4 and 6) or shackle. The feathers are generally removed in the following order: tail, wing, sides, legs, back, hips, wings, and neck. Pin feathers may be removed with a pinning knife (Fig. 9) or pincers used for removing strawberry stems. A good picker can pick 20 or more chickens per hour, by hand, if they have been properly scalded at 128°-140°F and are not "pinny."

Mechanical picking (Fig. 10) may be used to advantage to remove nearly all but the pinfeathers where several birds are to be dressed. Picking with the aid of a mechanical picker is about three times as fast as picking by hand.

Singeing should follow picking, especially with old birds or others that have hairlike structures protruding from the skin. A flame is passed over the surface of the bird very quickly. A flame produced by a piece of brown wrapping paper, an alcohol flame, or a blow torch will suffice. A gas jet flame may be used. (Fig. 11)

Cooling

Cooling is a must to prolong the keeping time of poultry. Cooling reduces the amount of ice required for ice packing and reduces the refrigeration required for freezing after packaging.

Before evisceration: Chilling of poultry

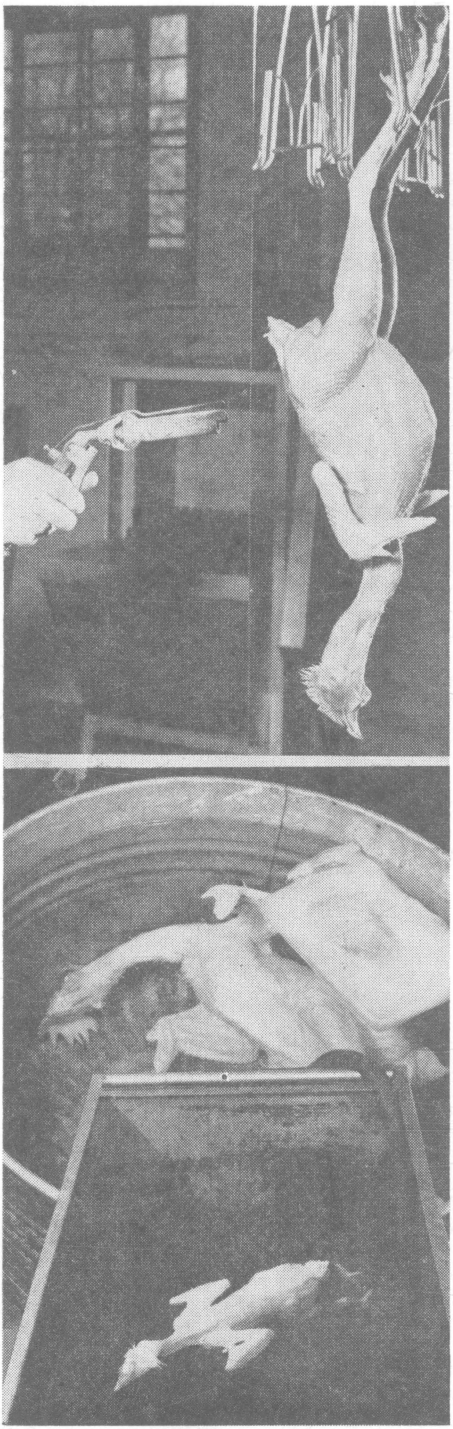


Fig. 11—Singeing with gas flame.
Fig. 12—Cooling in ice water.

immediately after picking and before evisceration permits the muscles and fat to "set or harden," thereby making the handling and cutting easier. A tub or tank of cold running tap or ice water (Fig. 12) will reduce the body temperature several degrees in an hour and facilitate handling of the bird during evisceration. Water cooling immediately after picking also lessens the darkening of the meat, especially if a high scalding temperature has been used.

The longer birds are held before evisceration, without proper cooling, the greater the amount of "visceral taint" or "off odor" in the body cavity. This odor results from bacterial action in the intestinal tract. Prolonged holding before evisceration will also result in bile staining of the liver and adjacent tissues.

After evisceration: The present trend in line operated dressing plants is to eviscerate the birds on the line as soon as picked and cool them afterwards.

It requires less handling and cooling is quicker, since the body cavity has been opened. It also eliminates the possibility of "visceral taint" and bile staining.

The disadvantage of water cooling of poultry is the absorption of water into the tissues as the bird cools. This takes place to a greater extent in eviscerated birds than in those that have not been opened. If the birds have not been thoroughly washed and the water changed frequently, blood and bacteria may be absorbed into the meat and reduce the quality and wholesomeness of the product.

Sanitary requirement for poultry processing plants include the following for cooling:

1. The temperature in the cooling tank should be under 40°F at all times.

2. Birds should not remain in the cooling tank longer than 8 hours without changing the water.

3. Birds should be cooled to an inter-

Fig. 13—Removing oil gland.
Fig. 14—Removing feet and head.

nal temperature of 40°F or less within 24 hours.

Cold running tap water will suffice for early cooling, before evisceration, since the temperature of the bird is about 107°F and that of the water about 55°F. However, it is not cold enough for holding fresh slaughtered birds longer than 2 or 3 hours.

Evisceration

Evisceration is the removal of the head, feet, intestinal tract, lungs, reproductive organs, and oil gland from dressed poultry; and recovery of the giblets (heart, liver, and gizzard). It is usually done differently when processing small broilers, roasters, and cut-up poultry.

Broilers and Fryers
(Halved or quartered)

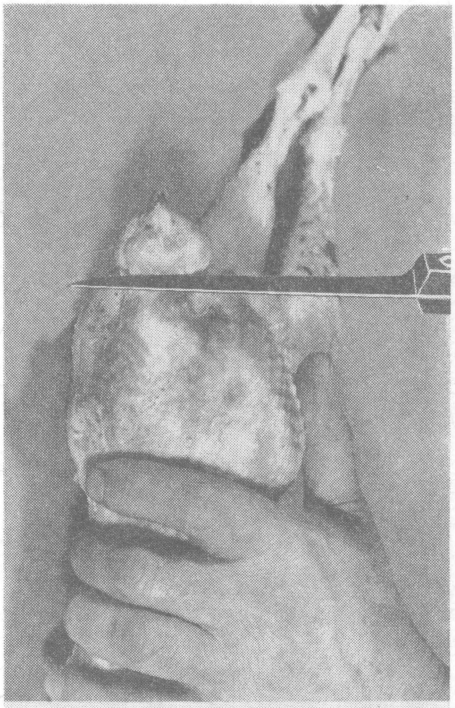
1. Remove the oil gland (Fig. 13) with a sharp knife by cutting under the sac to the backbone and up toward the tail.

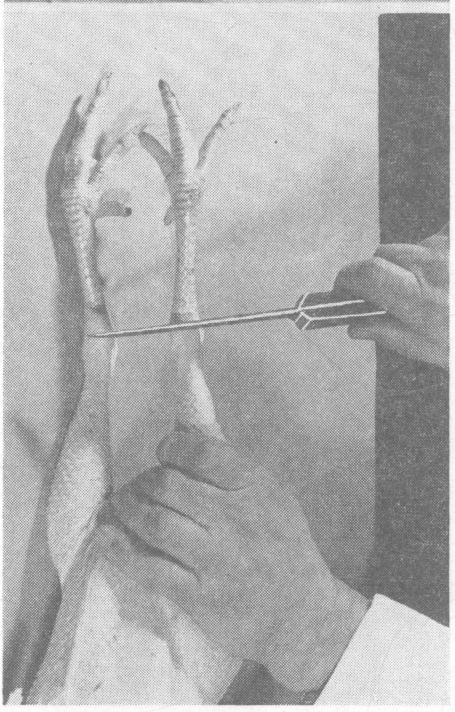
2. Remove the feet (Fig. 14) and head with a pair of shears or knife.

3. Cut through clavicle and rib bones on each side of the backbone (Fig. 15) with a sharp straight or hooked linoleum knife.

4. Cut around the vent and pull out the backbone and neck (Fig. 16).

5. Open the bird along the back and





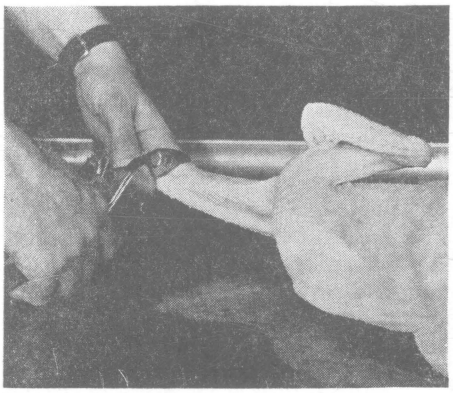
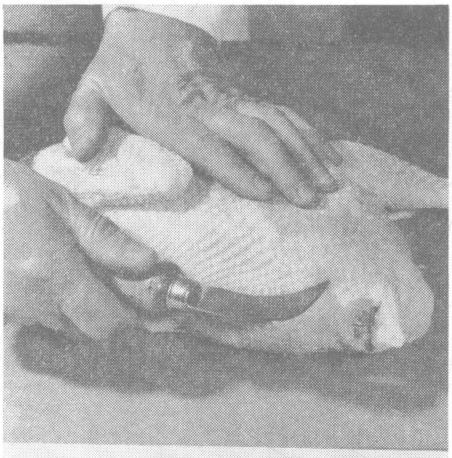
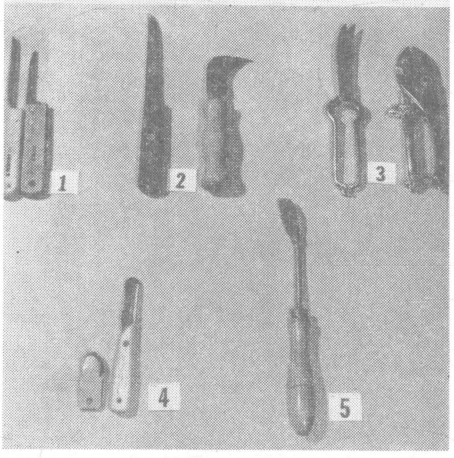


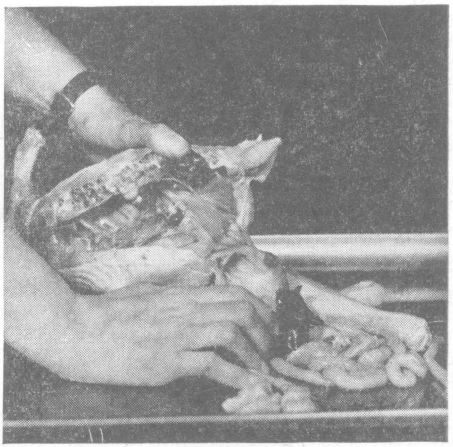
Fig. 15—Opening down the back.
Fig. 16—Removing backbone and neck.
Fig. 17—Some poultry dressing tools.





pull out the intestinal tract, lungs, and trachea, and ovary or testes.

6. Remove the heart, liver, and gizzard from the viscera.



7. Cut through the thick wall of the gizzard lengthwise, to the lining but not through it, and peel out the contents.

8. Remove the gall bladder from the liver without breaking it. Grasp the bladder between the thumb and forefinger of one hand, close to the liver, and pull it loose. If it breaks, wash off the bile immediately.

9. Cut open the heart; wash it free of blood; and remove any adhering large blood vessels.

10. Wash and drain the giblets (heart, liver, and gizzard). They may be wrapped and placed with the broiler.

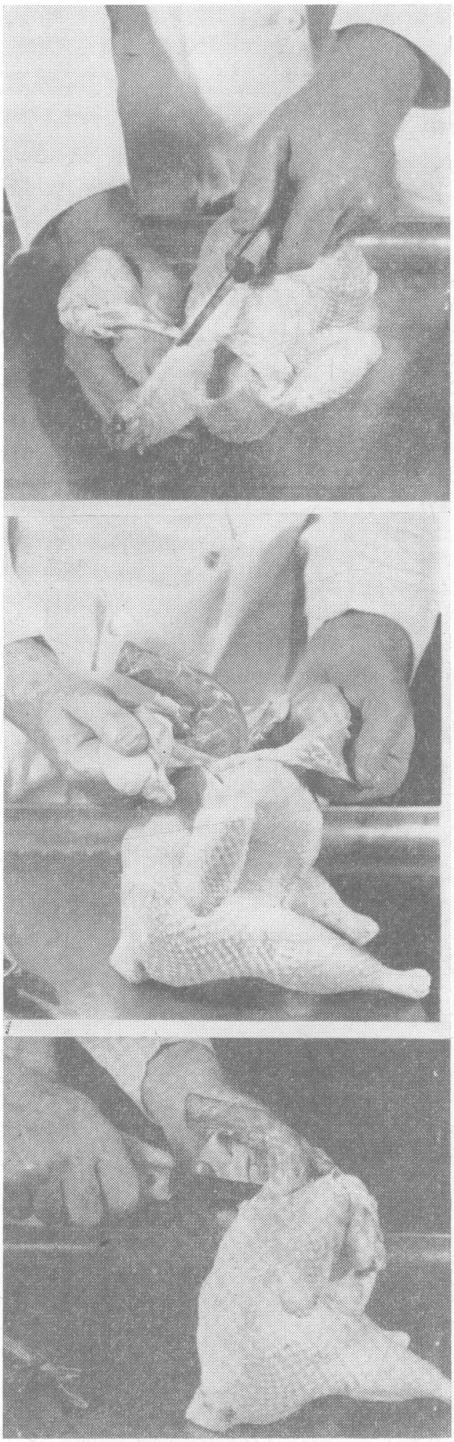
11. The backbone and neck strip are usually cut in three pieces.

12. The broiler is thoroughly washed and drained before cutting up or packaging.

13. Broilers weighing 1½ to 2 pounds, when processed ready-for-the-oven, are often cut in halves.

14. Fryers, weighing 2 to 3 pounds when ready for the oven, are often cut into quarters, yielding two pieces of dark meat and two pieces of white meat. They are sometimes cut into 10 or 12 pieces, the same as fowl (Fig. 22), especially if the fryer weighs about 3 pounds or more when ready for the oven.

Fig. 18—Steps in dressing a roaster. Removing neck.



Roasters:

1. Remove the oil gland, feet, and head as described for broilers (Figs. 13 and 14).

2. Split the skin down the back of the neck (not the front) from shoulder to tip (Fig. 18) and pull it loose from the neck.

3. Loosen the crop and windpipe from the neck skin and cut or tear them loose where they enter the body.

4. Make a transverse cut into the body cavity at the rear of the keel and another one around the vent (Fig. 19).

5. Insert the hand in the cut just under the keel; and pull the viscera out without breaking the liver, gall bladder, and small intestine.

6. Remove the lungs with the fingers or with the aid of a lung remover.

7. Remove the ovary and oviduct or testes.

8. Wash the bird thoroughly inside and out with clean, cold water and hang up to drain.

9. Clean, wash, drain, and wrap the giblets as described for broilers.

10. Insert the giblets and neck in the body cavity.

11. Push the legs forward and down to disjoint them and push them through the opening made around the vent (Fig. 19).

12. Pull the neck skin over the back; press the wings close against the body; and lay the roaster on its back (Fig. 19).

Fowl (Cut up)

1. Remove the oil gland and head and feet (Figs. 13 and 14) as described for broilers.

2. Remove the legs at the juncture with the body (Fig. 20) by cutting through the skin on the under side, pressing the leg outward to disjoint it and cutting through the joint, flesh, and skin up close to the back so as to include as much of the small muscle (oyster) as possible.

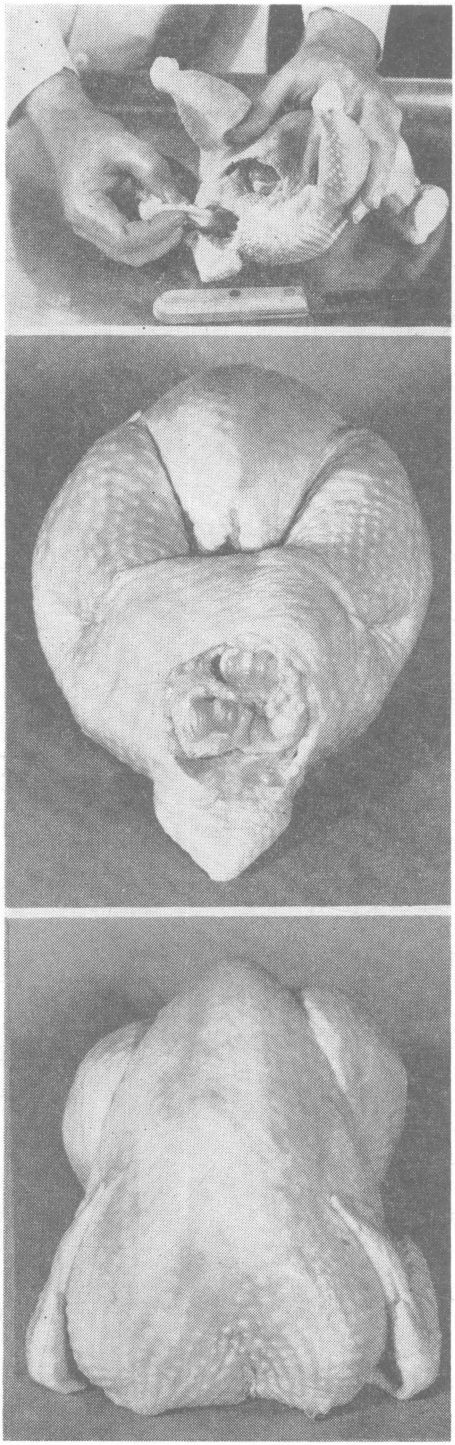


Fig. 19—Cut at rear of keel and around vent. Trussed bird ready for oven.

3. Separate each leg into a thigh and drumstick by cutting through the joint.

4. Cut through the skin on the underneath of the wing at its juncture with the body. Push the wing outward to disjoint it and cut through the joint and on out (Fig. 20) so as to leave the muscle at the base of the wing on the breast.

5. Cut the breast loose from the back by cutting from the rear of the keel along each side (Fig. 20).

6. Pull the breast and back apart until the back breaks and exposes the viscera.

7. Remove the viscera and reclaim the giblets as described under broilers.

8. Cut the rear part of the back off at the point where it was broken.

9. Cut the front half of the back from the breast (Fig. 21) leaving the ribs attached to the back.

10. Cut off the neck and be sure that the gullet, crop, and windpipe have been pulled out.

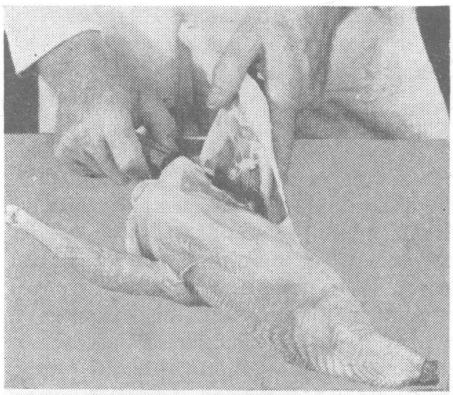
11. Cut the breast into two to four parts (Fig. 21) by cutting through the muscles in front of the keel and just behind the wishbone. If the breast is large, it may be desirable to split it along the keel as indicated by the dotted line.

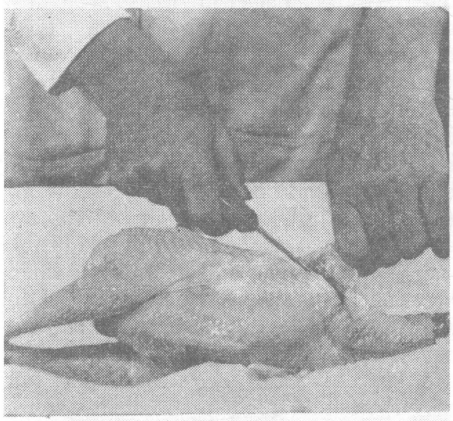
If the cut up bird (Fig. 22) is to be box packed for freezing, it is desirable to split both the front and back portions of the back along the backbone. This may be done with a cleaver or a meat saw.

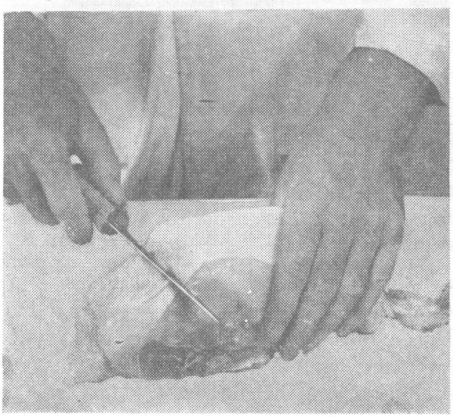
The percentage distribution by weight of parts of ready-to-cook poultry is about as follows:

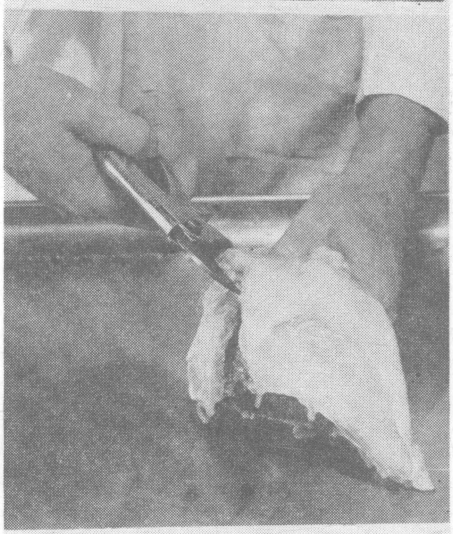
Breast	28-30
Legs and thighs	32
Wings	11-12
Back and neck	19-20
Gizzard and heart	4
Liver	3

Fig. 20—Cutting up a fowl.
Fig. 21—Pulling breast and back apart.
Cutting back from breast. Dividing breast.









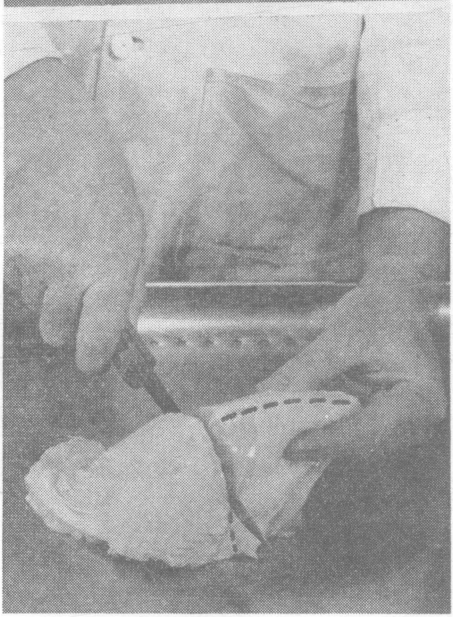
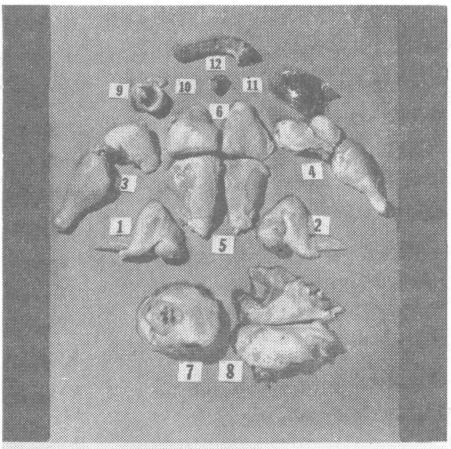
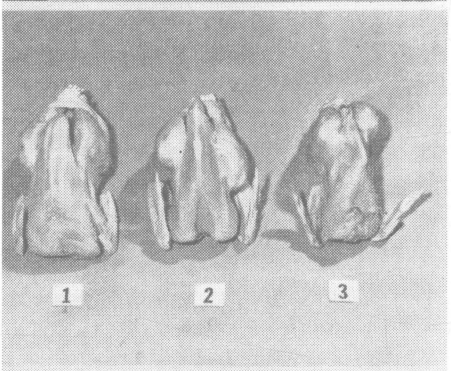


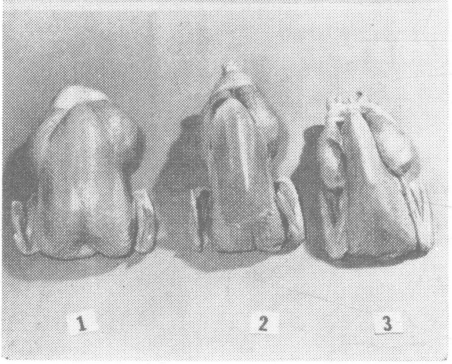
Fig. 22—Cut-up fowl: 1 and 2, wings; 3 and 4, drumsticks and thighs; 5 and 6, breast; 7 and 8, back; 9, gizzard; 10, heart; 11, liver; 12, neck.

Fig. 23—Grades of broilers: 1, GradeA; 2, Grade B; 3, Grade C.

Fig. 24—Grades of roasters: 1, GradeA; 2, Grade B; 3, Grade C.







Inspection and Grading

Poultry must be processed under certain minimum sanitary requirements before it can be sold in most of the larger cities and before it may carry the U. S. inspection and/or grade label.

Sanitary requirements include: (1) Building of sound construction and vermin proof; (2) doors and windows properly screened; (3) cooling facilities to cool birds to an internal temperature of 36°F within 24 hours; (4) floors, walks, and ceiling of material for easy and thorough cleaning; (5) efficient and adequate drainage and plumbing; (6) clean, ample, and safe water supply; (7) hot water (at least 180°F) for cleaning purposes; (8) equipment suitable for the purpose intended and of material that may be cleaned easily and thoroughly; (9) freezing facilities that will freeze ready-to-cook poultry solid within 60 hours; (10) the premises be kept free from refuse, waste, and all other sources of objectionable odors and conditions; (11) equipment and utensils used for preparing or handling poultry products shall be kept clean and in a sanitary condition; (12) the scalding tank shall be emptied and cleaned at least once daily; (13) the slaughtering room and equipment shall be cleaned at least once daily; (14) chilling vats or tanks shall be emptied and rinsed after each use and cleaned and sanitized at least once daily; (15) all persons handling edible products should wear clean frocks and keep their hands clean and be free of infected cuts, boils, open sores, and infectious diseases.

Inspection includes: (1) The health of the birds being slaughtered (p. 3); (2) the sanitary conditions under which poultry is being processed; (3) the wholesomeness of the birds for human consumption.

Inspection is under the supervision of a veterinarian. Most of the work may be delegated to "lay inspectors," persons who have less training than veterinarians in sanitation and the diagnosis of disease.

Inspectors reject birds with the follow-

ing diseases, if the entire body system has been affected: Tuberculosis, septicemia, leucosis, tumors, inflammation, toxemia, botulism, erysipelas, mold infections, fowl cholera, fowl typhoid and paratyphoid, pullorum disease, coryza, laryngotracheitis, fowl pox, trichomoniasis, blackhead, and coccidosis. If only a localized area is affected, it may be removed and the remainder of the carcass retained.

Grading (p. 3) may be done after inspection and completion of processing. If a good selection of healthy poultry has been made at the time of slaughter, the inspection and grading of the processed birds will be easier. The birds should be inspected at the time of evisceration and graded before they are cut-up or packaged.

There are three grades of poultry (Figs. 23 and 24). The principal specifications for each one are:

Factor	GRADES A	B	C
Conformation (See p. 3)	normal	practically normal	abnormal
Fleshing (See p. 3)	well fleshed	fairly well fleshed	poorly fleshed
Fat covering (See p. 3)	well covered	fairly well covered	lacking in fat covering
Pin feathers non-protruding	practically free	few scattered	numerous
protruding	free	free	free
Cuts and tears	none on breast and legs, up to 1½ in. elsewhere	up to 3 inches	no limit
Broken bones	none	one	no limit
Discolorations	none on breast and legs, up to ½ inch elsewhere	1½ to 3 inches	no limit
Freezer burn (dehydration)	few pock marks up to ⅛ in. diam.	moderate areas up to ½ in. diam.	numerous large dried areas

Packaging

Packaging is used for: (1) convenience in handling, (2) sanitary protection, (3) sales appeal, (4) preservation of quality, especially during frozen storage. Since packaging materials provide insulation and prevent free movement of air, poultry should be chilled below 40°F or at least cooled below 60°F before packaging.

For immediate retail sale: The bird or parts may be: (1) wrapped in butcher or waxed paper (Fig. 25) with the waxed side next to the meat, (2) placed in a transparent bag and/or wrapped in paper, (4) cut-up poultry may also be packed in a wax-lined box, with or without a transparent window (Fig. 25) and wrapped with paper. The poultry should be kept cold until the time of sale. The purchaser should place the bird in a household refrigerator at once and cook it the same or following day.

For immediate wholesale delivery: Packaging costs and handling expense may be reduced by packaging 6 to 24 birds per container. A waxed paper lined wirebound wooden box or orange crate may be used. The unwrapped birds are packed in alternate layers with ice, the paper folded over, and the lid closed and fastened. The birds should be chilled before packing; kept covered with ice until delivery has been made and the birds are used. The keeping time or shelf life of fresh ice-packed poultry is about 5 days, if it is kept well covered and chilled with ice.

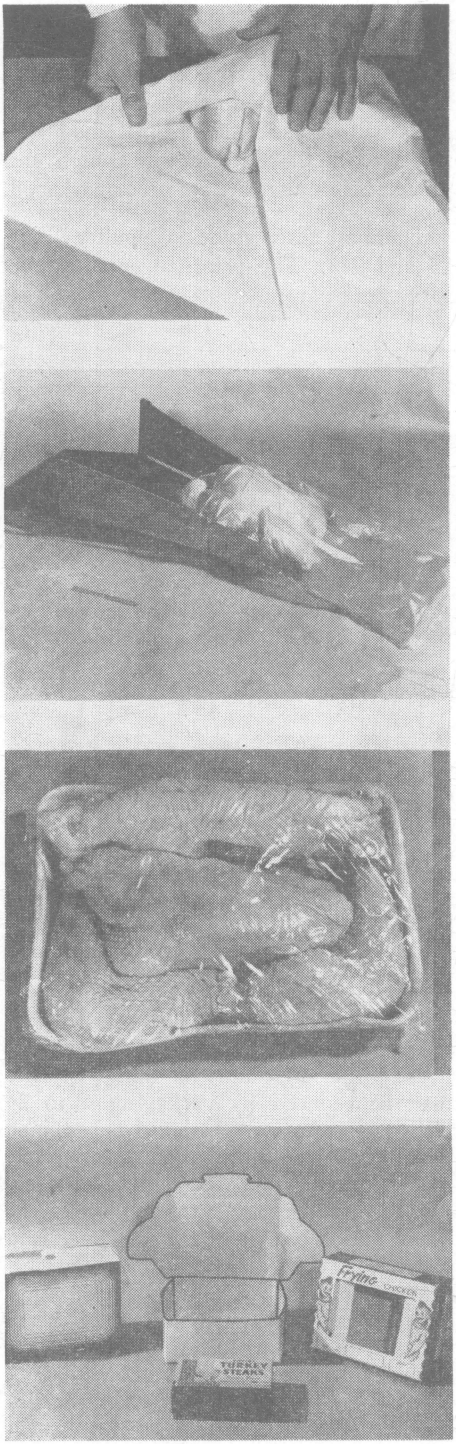


Fig. 25—Packaging for retail sale: In wax paper. In transparent bag. In tray and wrapped or bagged. In boxes.

For frozen storage: A suitable packaging material for frozen poultry should be: (1) moisture and vapor proof to prevent dehydration, (2) durable at low temperature and to the handling of the frozen packs, (3) attractive, (4) cheap, (5) easily applied.

Roasters and turkeys are usually packaged in a flexible transparent bag . The air may be removed by submerging the packaged bird in a can of water and twisting the end of the bag while it is pressed against the bird. Or, the air may be removed by pulling a vacuum, twisting the bag, and tying it. In the case of latex rubber bags, they may be made skin tight by dipping the packaged bird for a second or so in hot (205°) water.

For protection during handling and delivery, bagged frozen turkeys are often packaged in cardboard boxes.

Heavy gauge aluminum (Fig. 2b) foil is a satisfactory packaging material for poultry that is to be frozen. It may be wrapped and pressed around the birds. It is durable, fits close to the bird; and requires no tying or outer wrap.

Cut-up poultry may be packaged in a wood or fiber tray (Fig. 25); inserted in a latext rubber bag, vacuumized, and heat shrunk as described for roasters Or, the parts may be box packed as described for broilers, with an inside lining or an outside covering of moisture proof material.

In packaging poultry for frozen storage, it is essential to have as little air space within the package as possible. Otherwise, moisture is drawn from the meat and deposited as frost on the inside of the package.

Refrigeration

Poultry may be frozen at a temperature as high as 0°F providing the refrigerator is not over-loaded, the packages not stacked, and the temperature can be maintained.